Claims

1.   A method for determining one or more matches among one or more bids submitted by one or more participants comprising the steps of:

defining one or more alternatives for at least one of the bids;

defining one or more conditions among said one or more alternatives; and

determining one or more combinations of said alternatives that satisfy said one or more conditions.

2.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 1 further comprising the step of:

defining at least one first utility for representing a vale of at least one of said combinations.

3.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 1 further comprising the step of:

defining one or more second utilities for representing a value of said one or more alternatives.

4.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 3 wherein said first utility of said at least one combination is defined as a sum of said one or more second utilities of those of said one or more alternatives that are in said at least one combination.

5.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 4 wherein said sum os said one or more second utilities is a weighed sum.

6.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 2 further comprising the step of:

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determining at least one of said combinations that is optimal with respect to said at least one first utility.

7.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 1 wherein said determining one or more combinations of said alternatives that satisfy said one or more conditions step comprises the steps of:

representing said one or more alternatives and/or said one or more conditions with at least one satisfiability problem and

determining at least one solution to said at least one satisfiability problem.

8.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 7 wherein said representing said one or more alternatives and/or said one or more conditions step comprises the steps of:

defining at least one first variable B_{ij} representing at least one of said one or more alternatives wherein said variable B_{ij} corresponds to a jth one of said alternatives in an ith one o the bids.

9.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 8 wherein said representing said one or more alternatives and/or said one or more conditions step comprises the step of:

generating a first conjunction of one or more first disjunctive clauses of said at least one first variable B_{ij}.

10.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 9 wherein said one or more first disjunctive clauses are defined as $k(k-1)/2$ disjunctive

clauses: $\wedge \left\{ \neg B_{ig} \vee \neg B_{ih}, \text{ where } g \in 1..k, h \in 1..k \text{ and } g<h \right\}$.

11.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 9 wherein said representing said one or more alternatives and/or said one or more conditions step comprises the step of:

defining at least one second variable D_{igjh} representing at least one potential deal between two or more of the bids wherein said second variable D_{igjh} corresponds to said potential deal between a g th alternatives in an i th one of said bids and a h th one of said alternatives in a j th one of said bids.

12.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 11 wherein said representing said one or more alternatives and/or said one or more conditions step comprises the step of:

generating a second conjunction of one or more second disjunctive clauses of said at least one second variable.

13.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 12 wherein said one or more second disjunction clauses are defined as $k(k-1)/2$ disjunctive

clauses: $\wedge \left\{ \neg D_g \vee \neg D_h, \text{ where } g \in 1..k, h \in 1..k \text{ and } g<h \right\}$.

14.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 12 wherein said representing said one or more alternatives and/or said one or more conditions step comprises the step of:

generating one or more third disjunctive clauses to represent said one or more conditions and generating a third conjunction of said one or more third disjunctive clauses.

15.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 14 wherein said representing said one or more alternatives and/or said one or more conditions step comprises the step of:

generating an overall conjunction of said first conjunction, said second conjunction and said third conjunction.

16.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 11 wherein said at least one satisfiability problem is a MAX-SAT problem.

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17.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 6 further comprising the step of:

executing at least one of the matches for one or more of the bids that are identified by said at least one optimal combination.

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18.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 17 further comprising the step of:

distributing said at least one first utility among at least one of the participants who submitted said one or more of the bids of said at least one optimal combination.

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19.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 18 wherein said distributing said at least one first utility step comprises the step of:

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allocating said at least one first utility evenly among the participants over time to achieve fairness.

20.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 18 wherein said distributing said at least one first utility step comprises the step of:

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allocating said at least one first utility evenly among the participants for each of said executed matches.

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21.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 1 wherein said bids comprise:

one or more requests from one or more products and/or services and

one or more responses identifying one or more capabilities of one or more products and/or services.

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22.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 1 further comprising the step of:

defining one or more attributes for at least one of said bids.

23.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 22 wherein said determining one or more combinations of said alternatives step further comprises the step of:

identifying at least two of said alternative that have compatible ones of said attributes; and

assigning said identified alternatives to said one or more combinations.

24.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 22 wherein said attributes comprise one or more members of the set consisting of a visibility variable, an owner, a validity period, a negotiation timeout, a confirmation indicator, a manual indicator, a pre-execution explosion indicator, an execution explosion indicator.

25.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 22 wherein said attributes comprise one or more specifications.

26.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 22 wherein said one or more specifications comprise one or more members of the set consisting of stock keeping unit (SKU), a quantity, a delivery time window, a quality guarantee, a quality requirement, a fulfillment guarantee, a fulfillment penalty, a contract identifies, a price and a supplier restriction.

27.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 1 wherein said one or more conditions comprise one or more links between one or more groups of said alternative identifying relations between said alternatives within said group.

28.   A method for determining one or more matches among one or more bids submitted by one or more participants as in claim 27 wherein said relations comprise at least one compatibility relation.

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29.   Computer executable software code stored on a computer readable medium, the code for determining one or more matches among one or more bids submitted by one or more participants, the code comprising:

        code to receive one or more alternatives for at least one of the bids;

10   code to receive one or more conditions among said one or more alternatives; and

        code to determine one or more combinations of said alternatives that satisfy said one or more conditions.

15 30.   Computer executable software code stored on a computer readable medium, the code for determining one or more matches among one or more bids submitted by one or more participants as in claim 29, the code further comprising:

        code to represent said one or more alternatives and/or said one or more conditions with at least one satisfiability problem and

20   code to determine at least one solution to said at least one satisfiability problem.

31.   A programmed computer system for determining one or more matches among one or more bids submitted by one or more participants comprising at least one memory having at
25 least one region storing computer executable program code and at least one processor for executing the program code stored in said memory, wherein the program code includes

        code to receive one or more alternatives for at least one of the bids;

        code to receive one or more conditions among said one or more alternatives; and

30   code to determine one or more combinations of said alternatives that satisfy said one or more conditions.

32.   A programmed computer system for determining one or more matches among one or more bids submitted by one or more participants comprising at least one memory having at
35 least one region storing computer executable program code and at least one processor for

executing the program code stored in said memory as in claim 31, wherein the program code further includes:

code to represent said one or more alternatives and/or said one or more conditions with at least one satisfiability problem and

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code to determine at least one solution to said at least one satisfiability problem.

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